Supplier Research & Analysis Approach

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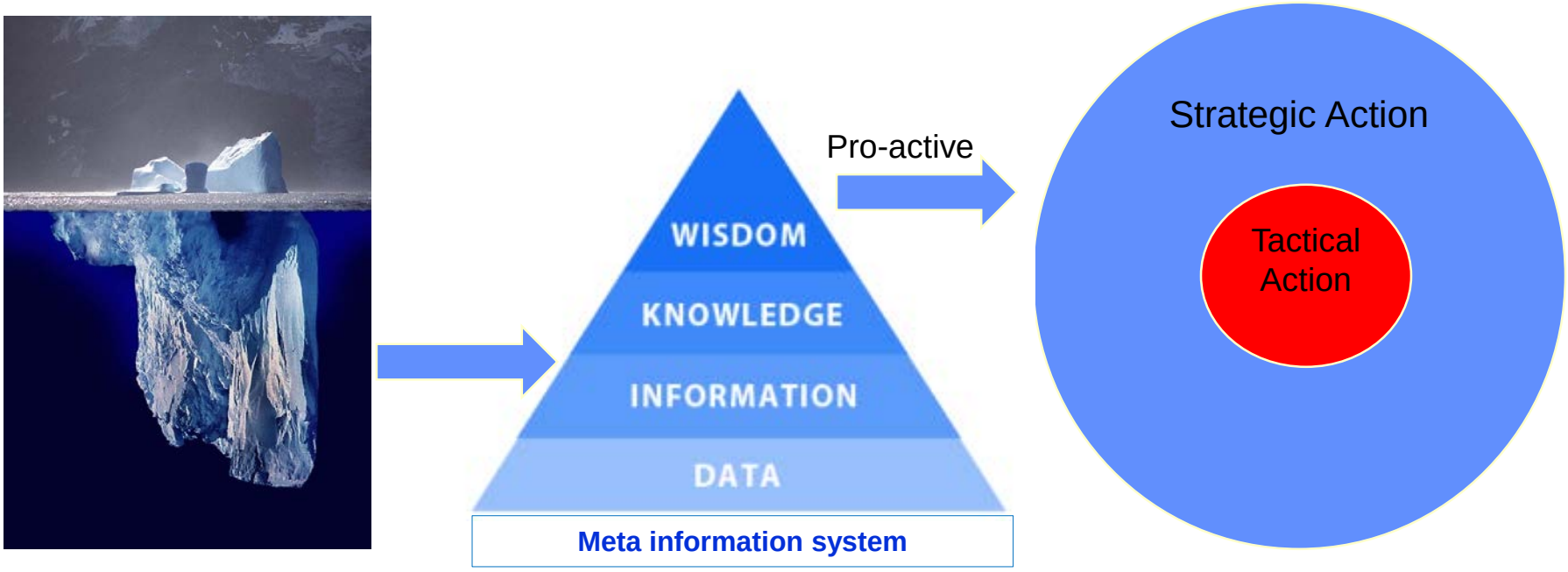
Presentation Topics

- Strategic Challenge / Supply Chain Risks
- Purpose / Key Attributes
- Analytical Framework
- Core Process / Report Types
- Products of Interest
- Case Examples
- Summary / Discussion

Strategic Challenge / Supply Chain Risks

- GSFC mission projects rely upon interconnected, multi-tiered supply chains of organizations operating under direct and indirect contracts and other agreements around the world that are subject to an interrelated and broad array of risks that can disrupt the provision of products and services when needed and in conformance with requirements

Building Knowledge for Informed Planning, Oversight and Decision Making



As we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know. Donald Rumsfeld, Secretary of Defense, 2002

Worldwide Locations of Suppliers

Source: NASA's Meta information system as of 04/16/2018

Purpose / Key Attributes

Purpose

- Supplier Research & Analysis (SRA) is designed to provide information on and insight into the operating environment, capabilities, performance and viability of current and potential suppliers for GSFC mission projects in support of SMA and project management needs

Key Attributes

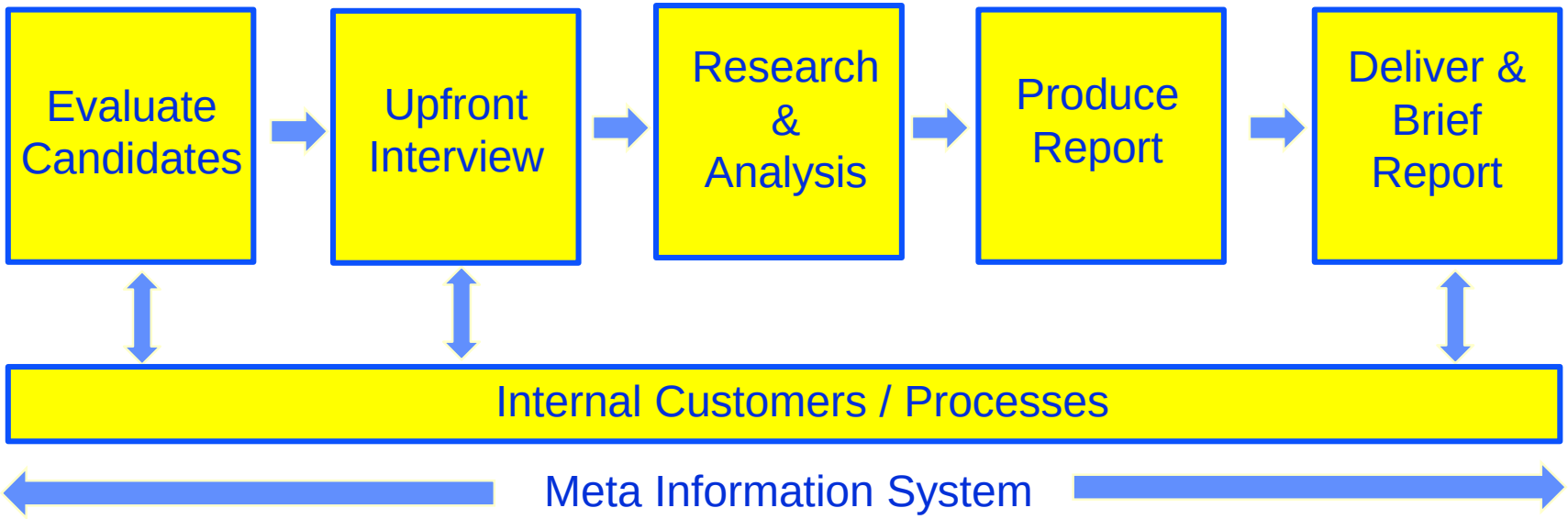
- Holistic analytical framework based on selected technical, business enterprise, market and security factors
- Guided by priorities, concerns, needs and products/services of interest
- Primarily open source information sources (cited with confidence ratings) blended with NASA / U.S. Government information
- Internal use only
- Non-intrusive
- Timely
- Affordable
- Sound, Credible
- Lean, multidisciplinary team
- Complementary to traditional SMA disciplines / project management methods

Analytical Framework

Categories	Key Factors
Technical	Quality Management, Manufacturing, R&D/Innovation
Business Enterprise	Leadership & Organization, Workforce, Supplier/Supply Chain Management, Financial Status, Business Alliances
Market	Industry Position, Market Trends, Regulatory & Legal
Security	Socioeconomic Environment, Cybersecurity, Physical Security

Core Process / Report Types

Core Process for Supplier Research & Analysis (SRA)



Levels of Research & Analysis / Report Types

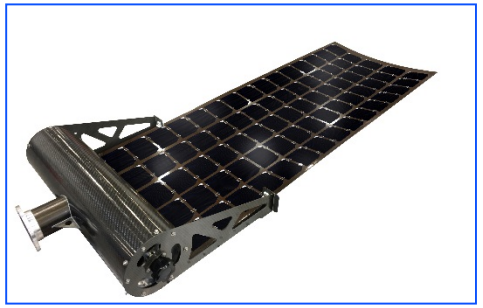
- Rapid Supplier Insight
- Supplier Information Profile
- Supplier Information Profile & SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis

Products of Interest

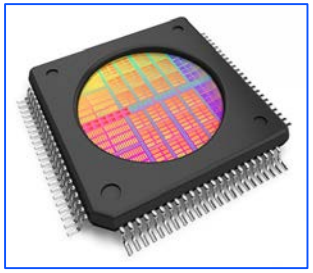
(examples)

Bipropellant Thruster Valve

Lithium-Ion Battery

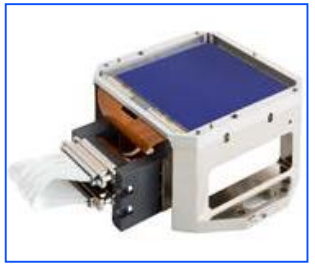


Solar Array

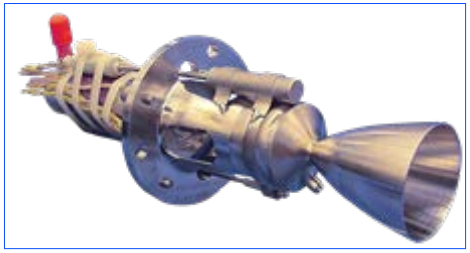


Semiconductor

Spacecraft Bus



Charge-coupled device

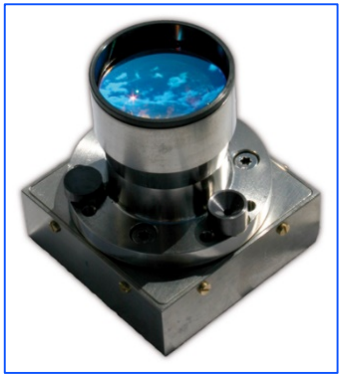


Thruster Engine

Inertial Reference Unit

Optical Encoder

Software



Star Tracker

Case Examples

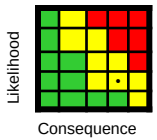
- Case 1: Very small, privately-held company (less than 10 employees) located 3500+ miles from GSFC under contract to produce components on the critical path of several GSFC mission projects
  - Leadership / business continuity: "one-man show"
  - Inadequate quality management, history of delivery delays and security concerns
- Case 2: Well-established, recurring commercial source ($300 million / year) of a critical component for GSFC mission projects under acquisition by a large corporation (~$3.0 billion / year)
  - Possible operational disruptions due to acquisition
- Case 3: Very large enterprise (~$10 billion / year) with multiple subsidiaries that supply key components / subsystems for GSFC mission projects experienced prior cyberattack and illicit technology transfer events
  - Future security incidents could impair design / production
- Case 4: Entrepreneurial business established in 2001 with experience in design / technology development for space systems identified as a potential subcontractor to develop and integrate micro-satellites for a possible mission
  - Home-based company led by an entrepreneur lacks capabilities at present…no discoverable facility for production/integration/test nor quality management

Supplier Research & Analysis reports illuminate strengths, weaknesses, opportunities and threats in providing insight and situational awareness

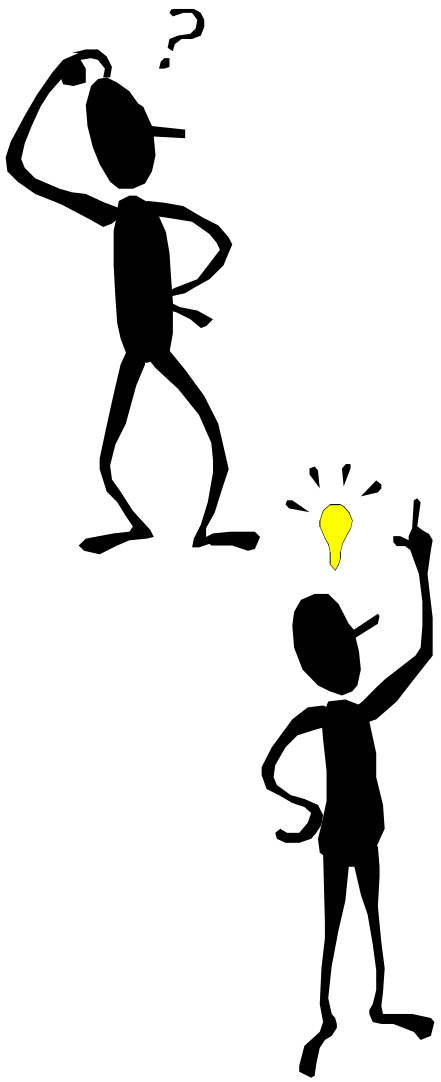
Case Example

Supplier Research & Analysis to Risk Management

Sourcing of XXXXX for GSFC Flight Projects

		Risk Statement (Condition; Consequence)	Approach: Research	Notes/Actions:
		Given that multiple GSFC projects are reliant upon two suppliers of XXXXX of which one (XXXXX) is vulnerable to business and market issues that could disrupt or terminate production; **there is a possibility** that GSFC projects could be effectively limited to a de facto sole source (XXXXX) **resulting in:** 1.insufficient production capacity to meet requirements on schedule at planned cost, and/or; 2.the need to urgently and reactively establish alternative sources with associated technical uncertainty, schedule delay and additional cost. **Context:** Supplier Research & Analysis reports provided insight into two suppliers of XXXXX upon which GSFC projects are reliant: XXXXX and XXXXX. GSFC experience with suppliers of XXXXX and XXXXX is limited primarily to XXXXX (as a key supplier to XXXXX) and XXXXX. XXXXX is a small privately-owned, family-run manufacturing company located in XXXXX with a workforce of ~ 35 to 50 employees and annual revenue of ~ $8.6 million. As such, it is relatively vulnerable to business and market risks that could disrupt its operations. Supplier of XXXXX products for: GOES 16(R), S, T, U; IceSat-2, JPSS 1, 2, 3, 4; JWST; Landsat-9; Lucy; Restore-L; RRM3; TESS, Europa Clipper Propulsion, and a potential supplier for WFIRST. XXXX (manufacturing facility in XXXXX) is a privately-held subsidiary of XXXXX public corporation (revenue of $1..2 billion in 2017). The organization's products are used in GSFC projects, including DSCOVER, JWST, LandSat-8 (LDCM), MAVEN, NICER, TDRS-12/L and Europa Clipper Propulsion.	**Actions per XX/XX/2018 meeting:** 1.Investigate and determine if suppliers of XXXXX have established or pending relationships with alternative, qualified suppliers of XXXXX. 2.Continue supplier research to identify and gain insight into current / potential suppliers of XXXXX and XXXXX.	**Risk Coordinator:** Code 382/J. Root **Risk Originator:** Code 382/J. Root **Update as of X-XX-2018:** Action 1: XXXXX Action 2: XXXXX **Recommendation**: monitor periodically to maintain awareness.
	Risk Rating Rationale Likelihood: Likelihood of XXXXX experiencing disruption or termination of its production of XXXXX is low but credible given the relative vulnerabilities of the organization. Consequence: Disruption or termination of XXXXX production could increase technical uncertainty, cause schedule delays and add to planned costs for multiple GSFC projects. Use of XXXXX that are defective could result in mission failure.			
	LxC = 2x4 **Risk Area: Supply Chain**  			

Summary / Discussion



An Old Proverb

For want of a nail the shoe was lost;

For want of a shoe the horse was lost;

For want of a horse the rider was lost;

For want of a rider the battle was lost;

For want of a battle the kingdom was lost;

And all for the want of a horseshoe nail.

In summary … in proven and innovative ways we are building knowledge for informed planning, oversight and decision-making in order to reduce the risks of exploring the Earth and space in achieving mission success